

ezBIDS

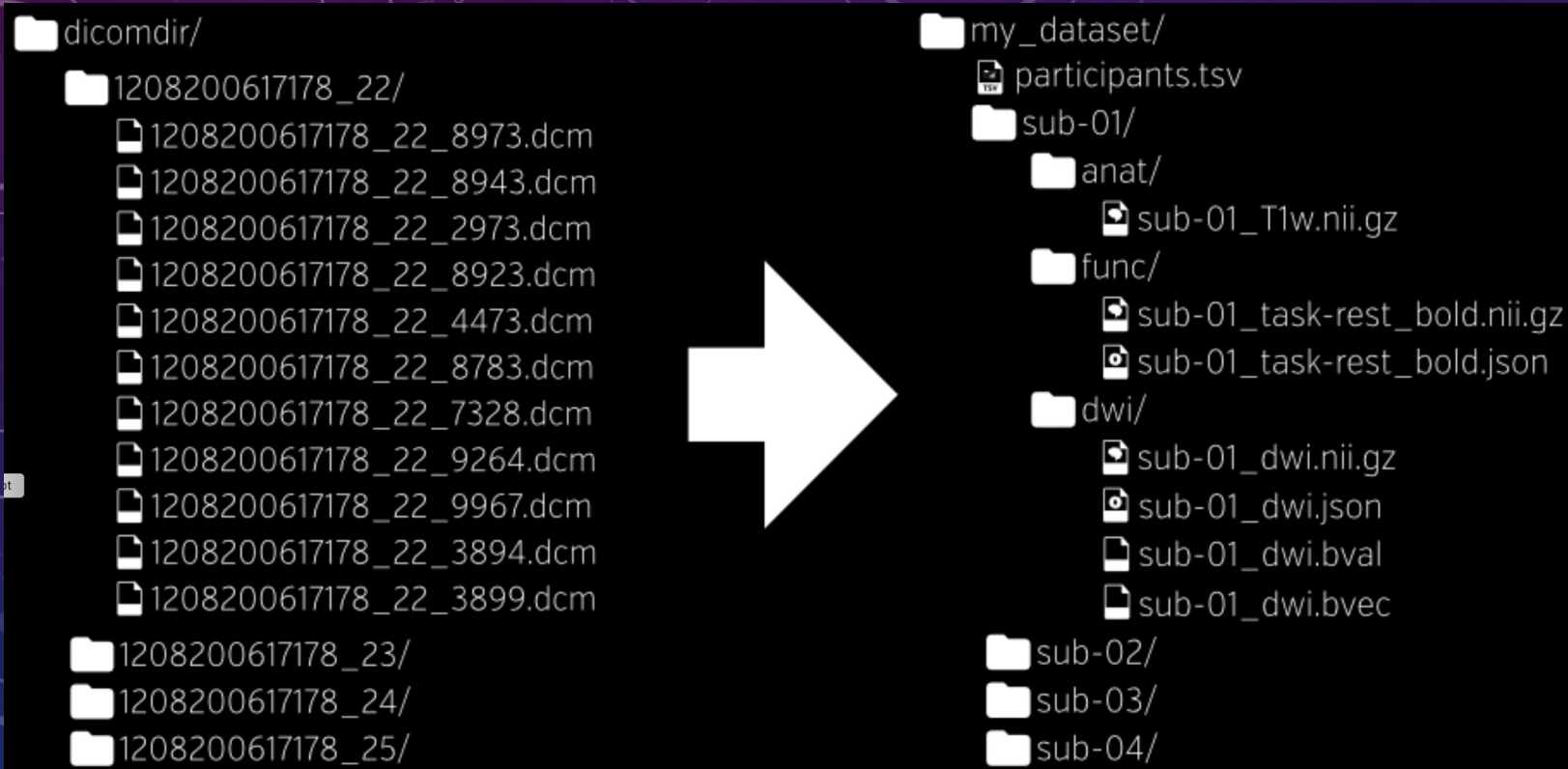
**Cloud-based graphical user interface
for automated DICOM to BIDS data ingestion**

Presenter: Dan Levitas

Soichi Hayashi and Franco Pestilli

Indiana University and The University of Texas at Austin

The BIDS standard: What is it and what does it do



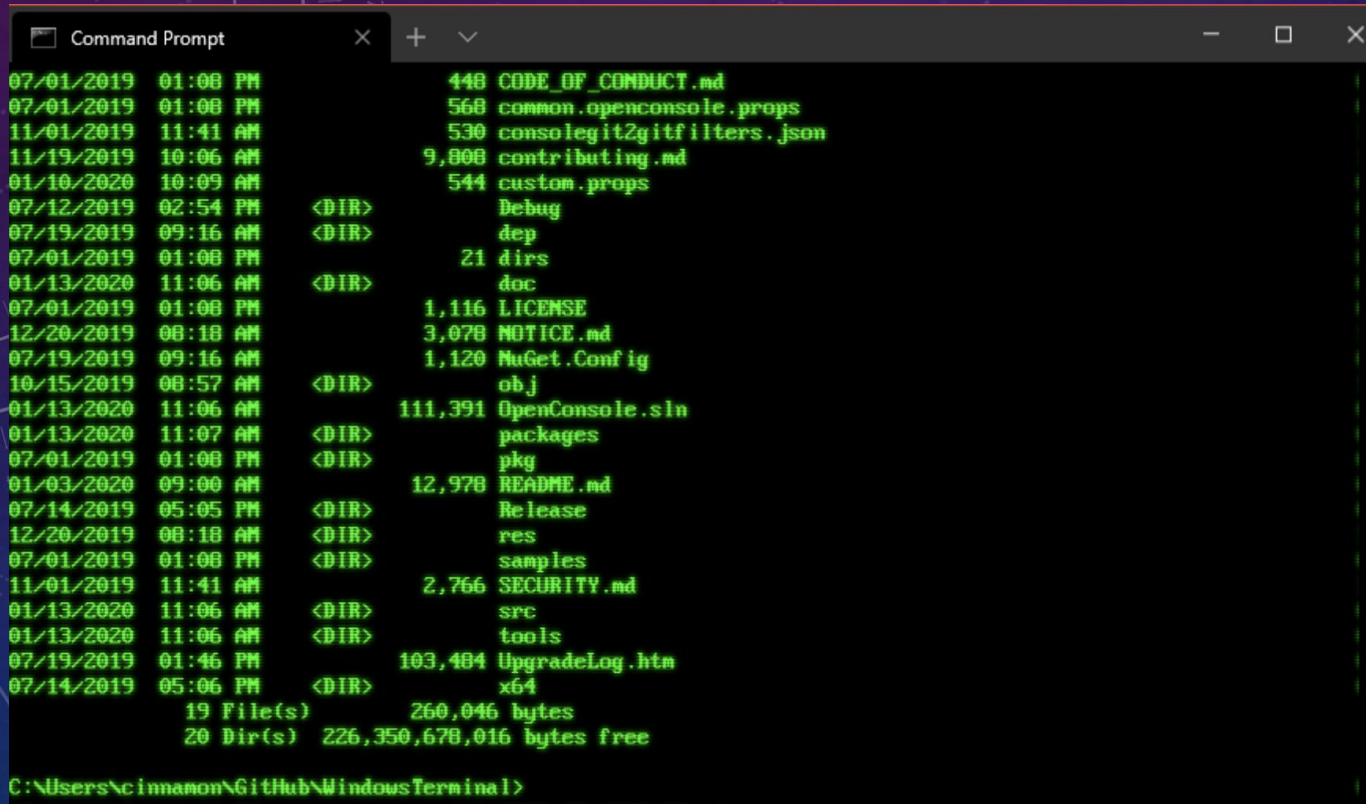
The awesomeness of BIDS!

- **Primary benefits of BIDS: data sharing and reproducibility**
- **Dozens of BIDS converters have been developed that take raw DICOMS from scanners and convert them to BIDS**



Barrier of Entry to BIDS & Data Sharing

- Not everyone likes green

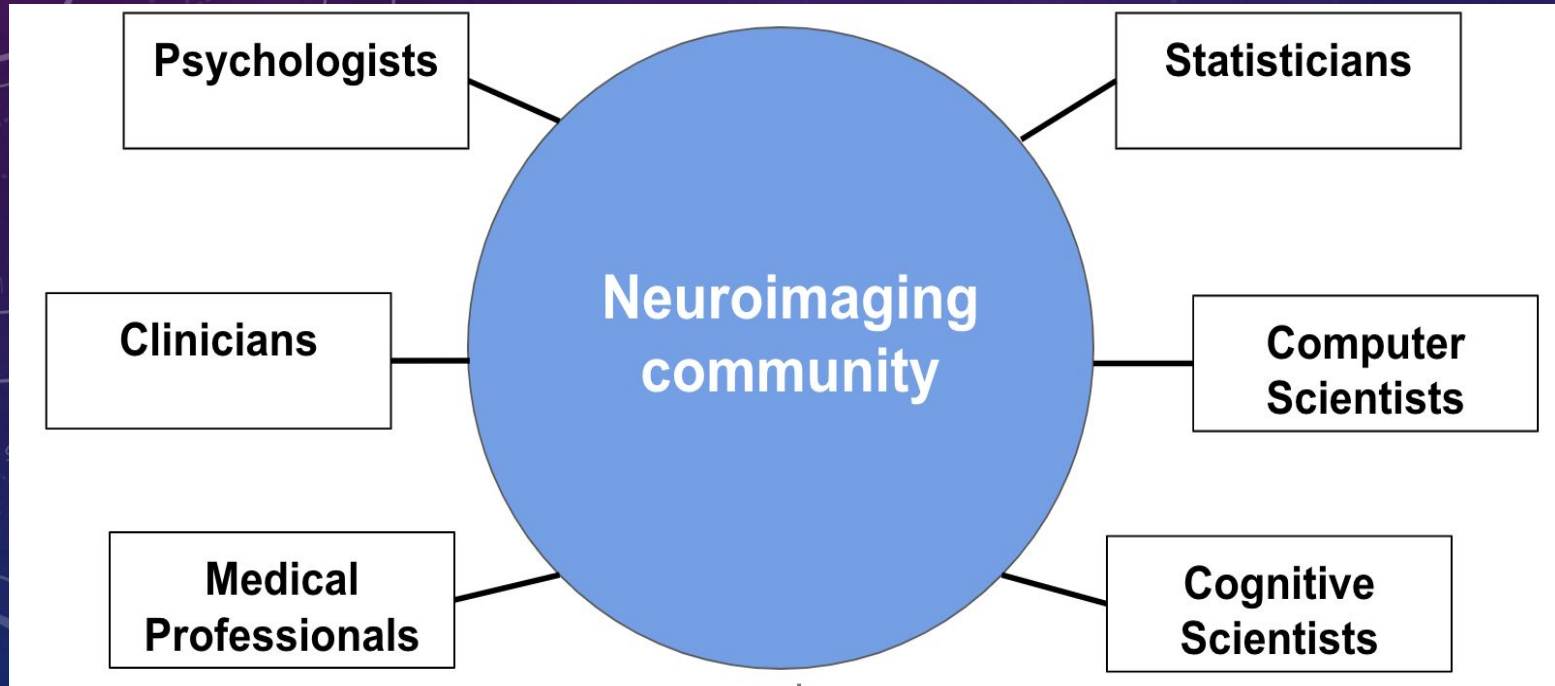


```
Command Prompt
07/01/2019 01:00 PM          448 CODE_OF_CONDUCT.md
07/01/2019 01:00 PM          568 common.openconsole.props
11/01/2019 11:41 AM          530 consolegit2gitfilters.json
11/19/2019 10:06 AM       9,800 contributing.md
01/10/2020 10:09 AM          544 custom.props
07/12/2019 02:54 PM    <DIR>          Debug
07/19/2019 09:16 AM    <DIR>          dep
07/01/2019 01:00 PM          21 dirs
01/13/2020 11:06 AM    <DIR>          doc
07/01/2019 01:00 PM       1,116 LICENSE
12/20/2019 08:18 AM       3,078 NOTICE.md
07/19/2019 09:16 AM       1,120 NuGet.Config
10/15/2019 08:57 AM    <DIR>          obj
01/13/2020 11:06 AM   111,391 OpenConsole.sln
01/13/2020 11:07 AM    <DIR>          packages
07/01/2019 01:00 PM    <DIR>          pkg
01/03/2020 09:00 AM       12,978 README.md
07/14/2019 05:05 PM    <DIR>          Release
12/20/2019 08:18 AM    <DIR>          res
07/01/2019 01:00 PM    <DIR>          samples
11/01/2019 11:41 AM       2,766 SECURITY.md
01/13/2020 11:06 AM    <DIR>          src
01/13/2020 11:06 AM    <DIR>          tools
07/19/2019 01:46 PM   103,484 UpgradeLog.htm
07/14/2019 05:06 PM    <DIR>          x64
          19 File(s)       260,046 bytes
          20 Dir(s)    226,350,678,016 bytes free

C:\Users\cinamon\GitHub\WindowsTerminal>
```

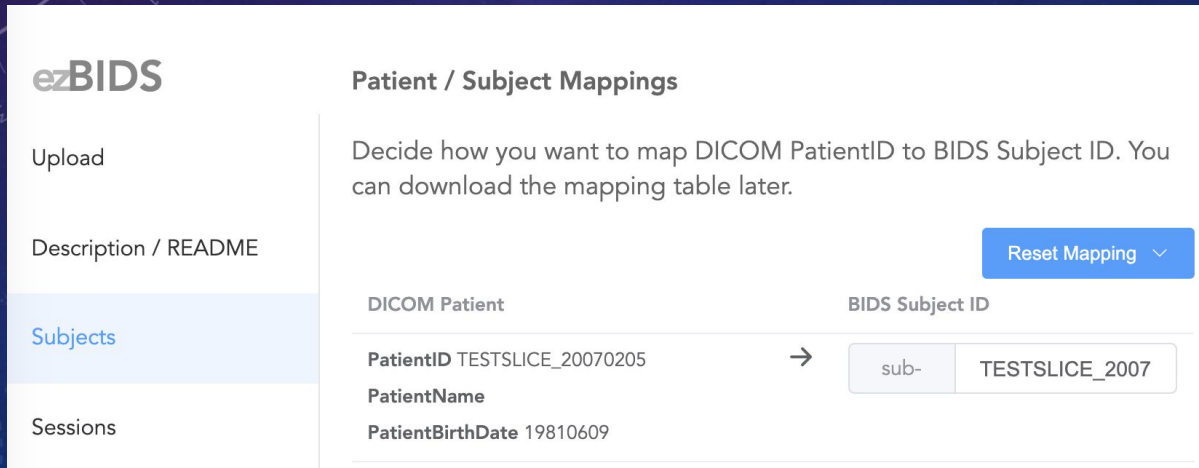

Barrier of Entry to BIDS & Data Sharing

- **BIDS conversion requires coding familiarity**
 - Not ubiquitous in the community



ezBIDS a graphical web interface for automated data capture and BIDSification

- We present ezBIDS, a tool for scanner to BIDS data ingestion
- ezBIDS uses a graphical interface to automatically capture DICOM files and transform them into BIDS
- ezBIDS works with the user to improve the result of the automated process and reduce errors



The screenshot displays the ezBIDS web interface. On the left is a navigation sidebar with the following items: Upload, Description / README, Subjects (highlighted in blue), and Sessions. The main content area is titled "Patient / Subject Mappings" and contains the following text: "Decide how you want to map DICOM PatientID to BIDS Subject ID. You can download the mapping table later." In the top right of this section is a blue button labeled "Reset Mapping" with a dropdown arrow. Below this is a table with two columns: "DICOM Patient" and "BIDS Subject ID". The table contains one row with the following data: PatientID TESTSLICE_20070205, PatientName, PatientBirthDate 19810609, and BIDS Subject ID sub-TESTSLICE_2007. An arrow points from the PatientID field to the BIDS Subject ID field.

ezBIDS

Patient / Subject Mappings

Upload

Description / README

Subjects

Sessions

Decide how you want to map DICOM PatientID to BIDS Subject ID. You can download the mapping table later.

Reset Mapping ▾

DICOM Patient	BIDS Subject ID
PatientID TESTSLICE_20070205 PatientName PatientBirthDate 19810609	sub-TESTSLICE_2007

ezBIDS

Upload

Description / README

Subjects

Sessions

Series

Participants

BIDS Structure

Finalize

Welcome to the ezBIDS - an online DICOM to BIDS conversion / organizing tool.

Drag & Drop a DICOM folder here to start

OR No directory selected.

ezBIDS

Upload

Description / README

Subjects

Sessions

Series

Participants

BIDS Structure

Finalize

Uploading ...



Total size 14 MB | 605 Files

- 473. 20180918GE_UI/mr_0004/axial_epi_fmri_interleaved_i_to_s-00050.dcm (101.8%)
- 474. 20180918GE_UI/mr_0004/axial_epi_fmri_interleaved_i_to_s-00010.dcm (101.8%)
- 475. 20180918GE_UI/mr_0004/axial_epi_fmri_interleaved_i_to_s-00138.dcm (0.0%)
- 476. 20180918GE_UI/mr_0004/axial_epi_fmri_interleaved_i_to_s-00058.dcm (0.0%)

ezBIDS

Upload

Description / README

Subjects

Sessions

Series

Participants

BIDS Structure

Finalize

A BIDS dataset requires "dataset description". Please populate the following information as much as possible.

Dataset Description

Dataset Name

DatasetType

BIDSVersion

License

Authors

Acknowledgements


How To Acknowledge

ezBIDS

- Upload
- Description / README
- Subjects**
- Sessions
- Series
- Participants
- BIDS Structure
- Finalize

Patient / Subject Mappings

Decide how you want to map DICOM PatientID to BIDS Subject ID. You can download the mapping table later.

Reset Mapping 

DICOM Patient	BIDS Subject ID
PatientID DEV	sub- <input type="text"/>
PatientName Test_Regression	
PatientBirthDate	

ezBIDS

- Upload
- Description / README
- Subjects
- Sessions**
- Series
- Participants
- BIDS Structure
- Finalize

AcquisitionDate / Session Mappings

Decide how want to map DICOM AcquisitionDate to BIDS Session IDs. You can leave it blank if it's single session. You can download the mapping table later.

[Reset Mapping](#) ▾

DICOM AcquisitionDate		BIDS Session ID
2018-09-18	→	<input type="text" value="ses- no session"/>

ezBIDS

[Upload](#)[Description / README](#)[Subjects](#)[Sessions](#)[Series](#)[Participants](#)[BIDS Structure](#)[Finalize](#)

Series / Datatype Mappings

Please update how you'd like to map each dicom SeriesDescription to BIDS datatype/entities.

Series Description		BIDS Datatype
Axial_EPI-FMRI_(Interleaved_I_to_S)	→	Datatype <input type="text" value="func/bold"/>
unique TRs:[5]		task- * <input type="text" value="rest"/>
		acq- <input type="text"/>
		ce- <input type="text"/>
		rec- <input type="text"/>
		dir- <input type="text"/>
		echo- <input type="text"/>
Axial_EPI-FMRI_(Sequential_I_to_S)	→	Datatype <input type="text" value="func/bold"/>
unique TRs:[5]		task- * <input type="text" value="rest"/>
		acq- <input type="text"/>
		ce- <input type="text"/>
		rec- <input type="text"/>

ezBIDS

- Upload
- Description / README
- Subjects
- Sessions
- Series
- Participants**
- BIDS Structure
- Finalize

Participants Info

You can optionally store metadata/phenotypical data for each subject/participants on this datasets within your BIDS dataset.

Phenotype Columns

Define phenotypical keys stored for this study (optional).

sex 🗑️
Long Name
Units
Description
Options TODO.. (levels)

age 🗑️
Long Name
Units
Description
Options TODO.. (levels)

ezBIDS

- Upload
- Description / README
- Subjects
- Sessions
- Series
- Participants
- BIDS Structure

Finalize

All done!

Re-Finalize

- Download BIDS
- Upload Data to **brainlife.io**
- Upload Data to **OpenNeuro**

[Subject Mapping](#) [Session Mapping](#)

***ezBIDS philosophy is to work with the user to improve the result of the automated process**

ezBIDS is part of the brainlife.io project and will soon be available on the platform

PESTILLI  LAB

brainlife

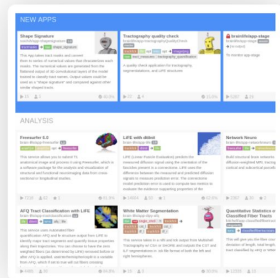
▶ Signup

➔ Home

Avesani et al., *Scientific Data* 2019

Free cloud platform for secure neuroscience data analysis.

Screenshot



DETAIL	DATASETS	PROCESSORS	PIPELINES	PUBLICATIONS
845 Subjects 15871 Datasets				
SUBJECT	DATATYPE	DESCRIPTION	CREATE ID	
SUBJECT001	RAW	subject001-raw	810217_1_00	11220194_12
	PREP	subject001-prep	11220194_12	11220194_12
	PREP	subject001-prep	11220194_12	11220194_12
	PREP	subject001-prep	11220194_12	11220194_12
	PREP	subject001-prep	11220194_12	11220194_12
SUBJECT002	RAW	subject002-raw	810217_1_00	11220194_12
	PREP	subject002-prep	11220194_12	11220194_12
	PREP	subject002-prep	11220194_12	11220194_12
	PREP	subject002-prep	11220194_12	11220194_12
	PREP	subject002-prep	11220194_12	11220194_12
SUBJECT003	RAW	subject003-raw	810217_1_00	11220194_12
	PREP	subject003-prep	11220194_12	11220194_12
	PREP	subject003-prep	11220194_12	11220194_12
	PREP	subject003-prep	11220194_12	11220194_12
	PREP	subject003-prep	11220194_12	11220194_12

COMPUTING RESOURCES

This App can run on the following resources.

gpu1-pestillab Cloud Providers	lu-carbonate (sh) HPC Systems
SCORE 12	
js-slurm2 (shared) Cloud Providers	lu-karst (shared) IU / Karst (deprecated)
SCORE 10	BUSY
az-slurm1 (shared) Cloud Providers	bridges (psc) HPC Systems
SCORE 10	BUSY

We plan to make ezBIDS interoperable with other systems such as



OpenNEURO

A free and open platform for sharing MRI, MEG, EEG, iEEG, and ECoG data



Sign in with Google



Sign in with ORCID

Thank you!



Dan Levitas



Soichi Hayashi



Franco Pestilli



NSF IIS-1636893 | NSF BCS-1734853 | NSF IIS-1912270 |

NSF AOC-1916518 | NIH NIBIB R01EB029272-01 | Microsoft Faculty Fellowship